Stock Portfolio Performance Comparison between Conventional and Sharia Stocks with Single Index Model Approach: A Case Study on Indonesia Stock Exchange

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Abstract: The purpose of this study was to compare Performance of Sharia and Conventional Stocks in Optimal Portfolio with Single Index Model Approach. The populations used in this study were all companies in the Indonesia Stock Exchange 2011-2013. Based on consideration of the specified criteria, obtained 201 companies samples of Sharia Stocks while conventional stock samples were 106 companies. This study used secondary data, such as daily stock prices and interest rates of BI. The analytical method used in this study was non-parametric different test. Based on the analysis of Single Index Model, Optimal Portfolio of Sharia stocks were consisted of 44 companies, whereas Optimal Portfolio of Conventional stocks were consisted of 29 companies. Based on the results of data analysis and discussion, it can be concluded as follows: 1) There is a significant difference between the Stock Return of Sharia and Conventional Portfolio during the period from 2013 to 2015. 2) There is a significant difference between the Sharia Stock Portfolio’s Performances: Sharpe, Treynor and Jensen Ratio in 2013-2015. 3) There is a significant difference between the Conventional Stock Portfolio’s performances: Sharpe, Treynor and Jensen Ratio in 2013-2015. 4) There are significant differences between Sharia and Conventional Stock Portfolio Performance according to Sharpe, Treynor and Jensen Ratios in 2013-2015.

Keywords: Single Index Model; Portfolio Return; Sharpe; Treynor; Jensen; Sharia; and Conventional.

1. Introduction

In investment, the value of an asset may change from time to time due to changes in market conditions. Therefore, investors need to monitor and evaluate the performance of the investment portfolio to see how far the chosen strategy works to achieve its investment objective. Tandelilin (2010: 488) argues that like an evaluation on the performance of the company, a portfolio should also be evaluated its performance. Portfolio performance evaluation will be related to two main issues, namely: 1) to evaluate whether the return of the portfolio that has been formed is able to provide a return that exceeds other portfolio’s return used as benchmark, and 2) to evaluate whether the return obtained in accordance with the level of risk that must be borne.

One form of financial investment in Indonesia capital market is stock. Stock as one of the products traded in the capital market has a variety of classifications. There is a classification based on the views of a particular religion or ethics, which is better known as faith-based stock. This share is the opposite type of sin stock. The classification of shares based on a particular view of religion or ethics could help investors to remain invested in stocks but not abuse theirs’ trust. Indonesia, which is consist of 87% Muslims (CBS, 2010), distinguish the stocks into 2 groups: accordance with Islamic principles and not accordance with Islamic principles.
As of May 2015, the number of companies that meet all these requirements and included in the List of Islamic Securities as many as 334, or about 64.35% of the 519 companies listed in the Indonesia Stock Exchange. Indonesia Stock Exchange is also working with PT Danareksa Investment Management make up the index to calculate the average price of stocks that meet the criteria of Sharia (registered in the List of Islamic Securities) which known as Indonesia Sharia Stock Index.

All investors definitely want to have some benefits from capital participating to the company. To achieve these objectives, the investors must make an analysis of the shares. This is consistent with the theory of Markowitz (1959: 77-91), do not put your eggs into one basket. So, in the investment, do not put the money in just one type of stock. This is commonly referred to as a diversified stock. So, to reduce the risk, investors can diversify their stock by establishing a stock portfolio (Suherman and Setyawan, 2006: 52).

The portfolio is a combination of various instruments or investment assets which are arranged to achieve the purpose of investors in investment. To get the optimal portfolio investors requires an analysis that can generate optimum return. One alternative that can be used by investors is Single Index Model Approach. This analysis of securities is conducted using Cut-Off Point and compared the value of the excess return to beta (ERB) with a value of C_i of each stock.

Stock portfolio performance also needs to be analyzed so that investors can know where the portfolio has performed well so can be considered to take decisions in investing. There are three sizes that can be used in evaluating the performance of the portfolio by using risk adjusted return, namely: Sharpe Ratio, Treynor Ratio and Jensen Ratio.

1.1. The Structure
a. The increasing number of companies going public that listed in Sharia Stock Index Indonesia will increase Indonesia’s public interest, which is predominantly Muslim, to invest in stock market. However, before investing, it would be better if the investors are equipped with the knowledge of stocks diversification to be able to evaluate the return and risks of the investments selected.
b. This research is important to do because the growth of Indonesian economy is likely to slow, therefore the role of Islamic principles expected can improve the economy, for example it can increase the number of Sharia companies, also it can educate the public about Islamic Investment.
c. The research question is: Are there differences in the performance of Sharia Stocks and Conventional Stocks in optimal portfolio with Single Index Model Approach?
d. Steps of this research: first by forming an optimal portfolio of Sharia Stocks and Conventional Stocks. Next step is a measurement of portfolio performance based on the Sharpe, Treynor and Jensen Ratio.
e. This study is only limited to test different Islamic stock portfolio performance and conventional stock.

2. Related Works/Literature Review

2.1. Optimal Portfolio


Markowitz portfolio calculation method was considered quite complicated because it involves a lot of variance and covariance. William Sharpe (1963) developed a model called the Single Index Model. This model is used to simplify the calculations in the model of Markowitz. Markowitz model complexity is because this model involves a lot of variance and covariance in calculating risk portfolio (Hartono, 2014: 222).

Single Index Model can be used in the determination of the optimal portfolio by comparing the excess return to beta (ERB) with a cut-off-rate (C_i). The excess return to beta (ERB) is an excess of stock return over the return of risk-free assets (called the premium return per unit of risk as measured by beta). Cut-off-rate (C_i) is the quotient of the market and return premium variant of the error variance variant shares with stock market on individual sensitivity to the error variance shares.
2.2. Portfolio Performance Ratios (Sharpe, Treynor, and Jensen)

According to Bodie, et al. (2006: 563), we can collect some performance measures that are tailored to the risk and test the environment in which each measure to be the most relevant:

1. Sharpe Ratio: \( \left( \bar{r}_p - \bar{r}_f \right) / \sigma_p \)

Size Sharpe (Sharpe's measure) dividing the average extra yield of the sample period with a standard deviation of returns over that period. This ratio measures the exchange yields on total volatility.

2. Treynor Ratio: \( \left( \bar{r}_p - \bar{r}_f \right) / \beta_p \)

As Sharpe’s measure, Treynor's measure provides extra yield per unit of risk, but using systematic risk instead of total risk.

3. Jensen Ratio: \( \alpha_p = \bar{r}_p - [ \bar{r}_f + \beta_p (\bar{r}_m - \bar{r}_f) ] \)

Jensen’s measure is the yield of average portfolio above or below the yield predicted by CAPM, assuming certain beta portfolio and market returns average. Jensen is the size of the alpha value of the portfolio.

2.3. Related Works

Past research about optimal portfolio has been widely performed. Here are a few studies that comparing the optimal portfolio between Sharia and Conventional Stock’s and comparing performance comparison index according to Sharpe, Treynor and Jensen:

Jagric, et al (2007) in their research entitled Risk-Adjusted Performance of Mutual Funds: Some Tests. Jagric, et al (2007) found that ratings obtained from both Sharpe and Treynor ratio is almost the same, implying that funds are well diversified. Küçüksille and Pickles (2011) in their research entitled The Evaluation of Portfolio Performance By Using Data Mining Process And An Application Ise Stock Market found that Performance Sharpe, Treynor and Jensen from a different portfolio is higher than the market.

Peillexa and Rangau (2013) in his research entitled “Is There A Place for A Sharia-Compliant Index on the Paris Stock Market?” found that in terms of return over a period of time between 2007 and 2010, Shariah Index SBF 25 seems to be more competitive and less risky than conventional index. Then, Setiawan and Oktariza (2013) in the journal entitled Sharia and Conventional Stocks Performance of Public Companies Listed on the Indonesia Stock Exchange, shows that the risk-adjusted return of a portfolio of both stocks performed in the same manner. Finally, by using multiple regression analysis, the study found that financial ratios simultaneously shown to have a significant relationship with both Sharia and Conventional stock returns.

The difference of this study with previous studies (research gap) that this study is using the stocks listed on the ISSI (Indonesia Sharia Stock Index) and JCI (Jakarta Composite Index) in 2013-2015 and using the daily stock price compared to previous studies that used JII (Jakarta Islamic Index) with monthly or weekly stock price data. In this study, the method used in the formation of the optimal portfolio is Single Index Model and compare performance based on the Sharpe index, Treynor and Jensen.

3. Material & Methodology

3.1. Data

Research was conducted on the Indonesia Stock Exchange. This study was conducted from March to May 2016. The populations in this study were all companies listed in Sharia Stock Index (ISSI) during the observation period from 2013 to 2015 and the whole conventional companies listed on the stock exchange during the observation period 2013-2015. The sampling technique in this research was purposive sampling where samples must be enrolled during the study period and did not do a reverse or a stock split. Based on consideration of the specified criteria, obtained 201 companies samples of Sharia Stocks while conventional stock samples were 106 companies.
3.2. Method

Data analysis methods and hypothesis testing through two steps: first, form an optimal portfolio step and second, hypothesis testing step. There are six hypotheses to be tested using two different test method namely two different test groups and three different test groups. In addition, this study used a non-parametric testing.

4. Results and Discussion

4.1. Result

The first step. At this stage, conducted the formation of the optimal portfolio with a Single Index Model Approach. From the result of the formation, obtained as many as 29 Conventional Stocks that make up an optimal portfolio of conventional stocks, while for Islamic stocks, there are 44 Sharia Stocks that make up an optimal portfolio of sharia stocks.

The second step. In this step, conducted all hypothesis testing. The results of hypothesis testing can be seen in Table 1:

Table 1. Summary of Hypothesis Test Results

<table>
<thead>
<tr>
<th>H</th>
<th>Hypotheses</th>
<th>Variable</th>
<th>Examination</th>
<th>Name of Test</th>
<th>Asymp. Sig</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alleged that there is a significant difference of Return Portfolio between Sharia Stocks and Conventional Stocks in Optimal Portfolio during period 2013-2015</td>
<td>ReturnSharia ReturnConventional</td>
<td>Non Parametric</td>
<td>Mann Whitney</td>
<td>0.000</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>2</td>
<td>Alleged that there is a significant difference between Sharpe, Treynor and Jensen Performance of Sharia Stocks in Optimal Portfolio during period 2013-2015</td>
<td>SharpeSharia TreynorJensenSharia</td>
<td>Non Parametric</td>
<td>Kruskall Wallis</td>
<td>0.000</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>3</td>
<td>Alleged that there is a significant difference between Sharpe, Treynor and Jensen Performance of Conventional Stocks in Optimal Portfolio during period 2013-2015</td>
<td>SharpeConventional TreynorConventional JensenConventional</td>
<td>Non Parametric</td>
<td>Kruskall Wallis</td>
<td>0.004</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>4a</td>
<td>Alleged that there is a significant difference of Sharpe Ratio between Sharia Stocks and Conventional Stocks in Optimal Portfolio during period 2013-2015</td>
<td>SharpeSharia SharpeConventional</td>
<td>Non Parametric</td>
<td>Mann Whitney</td>
<td>0.000</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>4b</td>
<td>Alleged that there is a significant difference of Treynor Ratio between Sharia Stocks and Conventional Stocks in Optimal Portfolio during period 2013-2015</td>
<td>TreynorSharia TreynorConventional</td>
<td>Non Parametric</td>
<td>Mann Whitney</td>
<td>0.001</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>4c</td>
<td>Alleged that there is a significant difference of Jensen Ratio between Sharia Stocks and Conventional Stocks in Optimal Portfolio during period 2013-2015</td>
<td>JensenSharia JensenConventional</td>
<td>Non Parametric</td>
<td>Mann Whitney</td>
<td>0.000</td>
<td>There is a significant difference</td>
</tr>
</tbody>
</table>

Source: Processed Data SPSS, 2016

4.2. Discussion

4.2.1. Rate of Return Comparison between Shariah Stocks and Conventional Stocks in Optimal Portfolio with Single Index Model Approach

From the Mann-Whitney Test obtained Asymp value Sig. (2- tailed) 0.000 < 0.05, so it can be concluded that there is a significant difference of portfolio’s return between Shariah and Conventional Stocks in Optimal Portfolio during 2013-2015. From the test result is also known that the average stock return of Sharia for 2013-2015 is higher than the average stock return of conventional during 2013-2015. This indicates that the stock return of sharia is better than the conventional’s stock return.
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The results of this study supported by data from Bareksa on the development of capital market indices in Indonesia, during the last 3 years Jakarta Islamic Index generated return 5.49 percent, higher than the return generated by Jakarta Composite Index only gives 2.90 percent. Islamic stock index gain greater profits, especially when the condition of stocks in such usury-based banking or stock price decline, as happen in the January to May 2015.

4.2.2. Performance Comparison between Sharpe, Treynor and Jensen Ratio of Sharia Stocks in Optimal Portfolio with Single Index Model Approach during 2013-2015

Based on Kruskal-Wallis test results Asymp value Sig. (2- tailed) 0.000 < 0.05, means that there is a significant difference between Sharpe, Treynor and Jensen Ratio of Sharia Stocks in Optimal Portfolio with Single Index Model Approach during 2013-2015. If we look in the average value, it is known that the average performance of Sharpe is higher than any other performances. This is caused by differences in the variables used in the calculation of each method. Jensen, Sharpe and Treynor method built with different assumptions, because:

1. Jensen performance measure built on the assumption that investors will estimate the rate of return is constant during the investment period.
2. Sharpe performance measure built on the assumption that this measure is a return measure from rate of return ratio divided by risk. Sharpe method stated that net portfolio performance is the result of a portfolio with a risk-free interest rate per unit, and if it gets a positive result and the greater the portfolio’s performance is getting better.
3. Treynor performance built on the assumption that the stock is very diversified. This measure is a return measure per unit of risk. This excess return is defined as the difference between stock returns with risk-free rate of return on the same evaluation period. Treynor method states that the index is a measure appropriate for the full diversified portfolio.

The predictive’s power of those three measures are different and this proves that the results differ significantly.

4.2.3. Performance Comparison between Sharpe, Treynor and Jensen Ratio of Conventional Stocks in Optimal Portfolio with Single Index Model Approach during 2013-2015

From the Kruskal-Wallis test, can be seen the value Asymp Sig. (2- tailed) 0.000 <0.05, meaning that there is a significant differences between Sharpe, Treynor and Jensen Ratio of Conventional in Optimal Portfolio with Single Index Model Approach during 2013-2015.

The big difference in the analysis of Conventional’s Stock Performance Methods (Sharpe, Treynor, and Jensen) resulting in better portfolio management investment managers both individual investors will do some stages. The final stage is very important that an evaluation of the performance of the portfolio that had been developed previously. Sharpe, Treynor and Jensen can be used in the selection of investments by looking at the ongoing market conditions. The third measure was basing its analysis on the past return to predict return and risk in the future. Sharpe insists on a total risk (standard deviation), Treynor regard to market fluctuations play an important role in influencing the return (beta), while Jensen’s own emphasis on alpha. So these of three methods have its own characteristics.

4.2.4. Performance Comparison of Sharpe, Treynor and Jensen Ratio between Sharia Stocks and Conventional Stocks in Optimal Portfolio with Single Index Model Approach during 2013-2015

From the Mann-Whitney Test for hypotheses 4a, it can be seen the value Asymp Sig. (2- tailed) 0.000 < 0.05, meaning there is a significant difference Sharpe Ratio between Sharia Stocks and Conventional Stocks. While the results of hypotheses 4b, it can be seen the value Asymp Sig. (2-tailed) 0.001 < 0.05, meaning there is a significant difference of Treynor Ratio between Sharia Stocks and Conventional Stocks. Furthermore, the results of Mann-Whitney Test for hypotheses 4c, it can be seen Asymp value Sig. (2- tailed) 0.000 < 0.05, meaning there is a significant difference of Jensen Ratio between Sharia Stocks and Conventional Stocks. If we look at the average value, it is known that the average performance of Sharia Stocks is higher than the average performance of Conventional Stocks during 2013-2015. This indicates that, overall, during the years 2013-2015, Sharia Stocks Optimal Portfolio has average performance better than Conventional Stocks Optimal Portfolio.
In the midst of a slowing economy, the performance of Islamic investment in the capital market is believed to be still great potential to keep growing. This is because stocks and other Islamic products in the capital market crisis are considered more resistant than conventional investment products. With the size of market that is not as big as the conventional market, the fall of the value of Islamic products proved to be relatively not much different from the conventional market that has great size and more variety of products.

5. Conclusion

The conclusions that can be drawn based on the results of this study: there is a significant difference of Return’s Portfolio between Sharia Stocks and Conventional Stocks in Optimal Approach with Single Index Model Approach during period 2013-2015. In addition, this research also found that there are significant differences between the performance Sharpe, Treynor and Jensen of Sharia Stocks and Conventional Stocks in Optimal Approach with Single Index Model Approach during period 2013-2015. The higher performance of Sharpe, Treynor and Jensen shows the better company’s performance.

Suggestions for further research are: extend research period (longer than 3 years), using all measures of performance appraisal ratio according to Bodie, et al. (2006: 563), examines the differences in portfolio risk and also to compare the results of portfolio formation with Single Index Model and other models.

References